

No. 879,504.

PATENTED FEB. 18, 1908.

C. B. WATTLES.
GRINDING OR POLISHING WHEEL.

APPLICATION FILED NOV. 18, 1907.

Fig. 1.

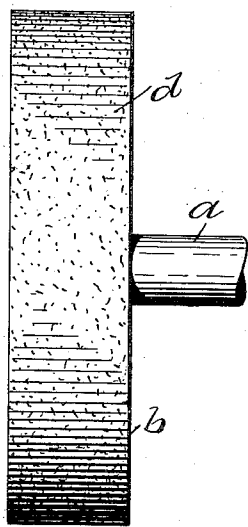


Fig. 2.

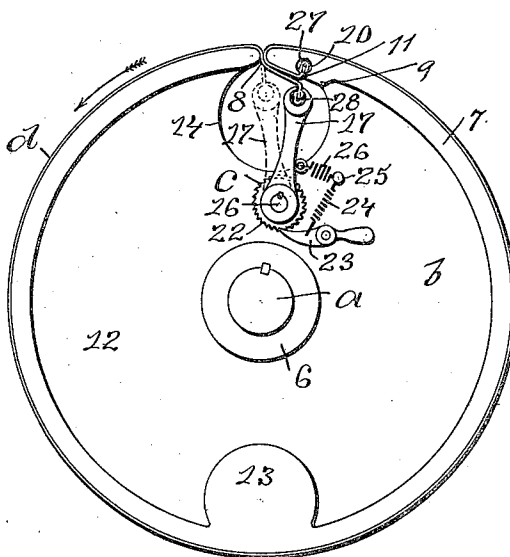


Fig. 3.

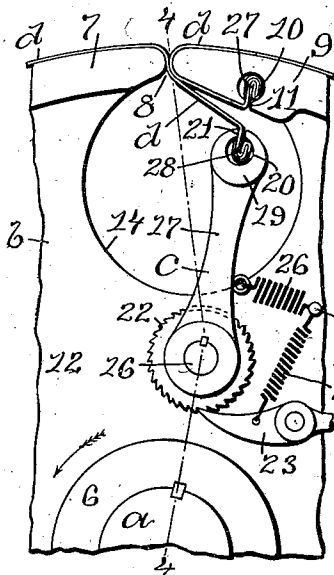


Fig. 4.

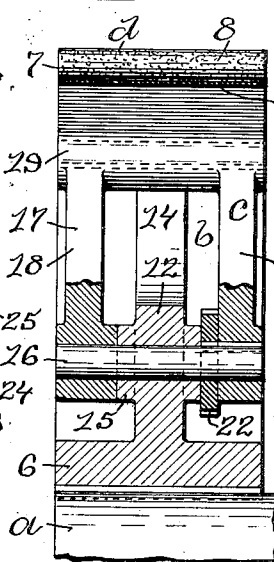
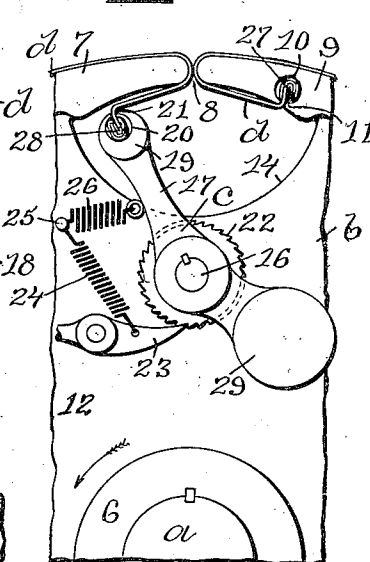


Fig. 5.



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CYRA B. WATTLES, OF PROVIDENCE, RHODE ISLAND ASSIGNOR TO SURFACING MACHINE COMPANY, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

GRINDING OR POLISHING WHEEL.

No. 879,504.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed November 18, 1907. Serial No. 402,573.

To all whom it may concern:

Be it known that I, CYRA B. WATTLES, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Grinding or Polishing Wheels, of which the following is a specification.

This invention has reference to an improvement in grinding or polishing wheels having a flexible detachable covering, such as paper or cloth having a surface of sand, emery or corundum for grinding or a fabric adapted for polishing.

The object of my invention is to improve the construction of a grinding wheel or roll, whereby a flexible abrasive or polishing material is detachably secured on the peripheral face of the wheel or roll and the slack of the same (caused by the abrasive or polishing material coming into contact with the work) automatically taken up and positively held by mechanism operated by the centrifugal force of the revolving wheel or roll.

My invention consists in the peculiar and novel construction of a grinding or polishing wheel or roll having mechanism operated by the centrifugal force of the revolving wheel or roll to automatically take up and positively hold the slack of the abrasive or polishing material secured on the peripheral face of the wheel or roll, said grinding or polishing wheel or roll and automatic take up mechanism having details of construction as will be more fully set forth hereinafter and claimed.

Figure 1 is a face view of my improved grinding or polishing wheel, showing a strip of flexible abrasive material on the peripheral face of the same. Fig. 2 is an end view of the wheel, showing the automatic take-up mechanism in the position for receiving the end of the strip of abrasive material in broken lines, in the extreme take-up position in full lines, and the means in the take-up mechanism for positively holding the slack of the abrasive material as it is taken up by the take-up mechanism. Fig. 3 is an enlarged detail end view of that portion of the wheel having the automatic take-up mechanism, showing the take-up mechanism in the extreme take-up position, and the means for detachably securing the ends of the strip of abrasive material to the wheel rim and to the automatic take-up mechanism. Fig. 4 is an enlarged detail sectional view taken on line 4-4 of Fig. 3 to more fully show the construction of the take-

up mechanism, and Fig. 5 is an enlarged detail end view similar to Fig. 3, showing a modified form of take-up mechanism.

In the drawings *a* indicates a shaft, *b* a wheel in the form of a pulley, *c* an automatic take-up mechanism, and *d* a strip of flexible abrasive material detachably secured on the peripheral face of the wheel by attaching one end to the wheel rim and the other end to the automatic take-up mechanism *c*. The shaft *a* is rotatably supported in suitable bearings (not shown) and is revolved at a high rate of speed by any well known means.

The wheel *b* is constructed to have a central hub 6 secured to the shaft *a*, an annular rim 7 in the peripheral face of which is a narrow transverse slot 8 parallel with the shaft *a*, an under thickened portion 9 at one edge of the slot 8 and having a transverse tubular hole 10 and a narrow parallel slit 11 extending from the hole 10 out through the inner face of the thickened portion 9, a central web 12 connecting the hub 6 with the rim 7 and having a counterbalanced portion 13 merging into the rim 7 opposite the slot 8, an opening 14 adjacent the rim 7 and into which the slot 8 enters and an off-center bearing 15 intermediate the hub 6 and the opening 14 for the shaft of the automatic take-up mechanism *c*, as shown in Figs. 2, 3 and 4.

The automatic take-up mechanism *c* consists of a shaft 16 supported in the bearing 15, a U-shaped member 17 having the arms 18 18, the free ends of which are secured to the shaft 16 at each side of the bearing 15, and the cross bar 19 which extends transversely through the opening 14 in the web 12 and has a longitudinal tubular hole 20, and a narrow parallel slit 21 extending from the hole 20 out through that side of the bar adjacent the rim 7, a ratchet gear 22 secured to the shaft 16, a pawl 23 pivotally secured to the central web 12 in a position to engage with the ratchet gear 22, a coiled spring 24 connected with a pawl 23 and with a stud 25 on the web 12, and a coiled spring 26 connected with the U-shaped member 17 and with the stud 25, as shown in Figs. 3 and 4.

The abrasive material *d* consists of a strip of paper or cloth covered on one surface with an abrasive substance, such as sand, emery or corundum, and having the beaded ends 27 and 28 formed by clamping a strip of thin metal over the ends and then folding the strip of metal on itself, as shown in Fig. 3.

In the modified form, as shown in Fig. 5,

the U-shaped member 17 has an oppositely-disposed weighted arm 29 which is thrown outward by the centrifugal force of the revolving wheel and moves the member 17 in an opposite direction. The strip of abrasive material *d* is secured on the peripheral face of the wheel by pushing the beaded end 27 into the hole 10 in the thickened portion 9 of the wheel rim 7 with the adjacent portion 10 of the strip extending under the thickened portion 9 and out through the slot 8. The pawl 23 is released from the ratchet gear 22, the U-shaped member 17 moved into the position, as shown in broken lines in Fig. 2, against the tension of the coiled spring 26, the portion of the strip *d* adjacent the end 28 is pushed edgewise through the slot 8, the beaded end 28 of the strip pushed into the hole 20 in the U-shaped member 17 with the adjacent portion of the strip extending out through the slit 21 and the strip wrapped around the peripheral face of the wheel. The member 17 of the take-up mechanism is now released when, through the tension of the coiled spring 26, the member 17 is drawn toward the stud 25 and the strip of abrasive material is drawn tightly around the peripheral face of the wheel.

When in use the wheel *b* is revolved at a high rate of speed in the direction of the arrow, as shown in Fig. 2. The strip of abrasive material *d* coming into contact with the work causes the strip to stretch lengthwise in the opposite direction to that in which the wheel revolves; thereby forcing the lengthened portion of the strip toward and through the slot 8. The centrifugal force of the revolving wheel acts on the take-up mechanism *c* to move the U-shaped member 17 from the position, as shown in broken lines in Fig. 2, toward the position shown in full lines, thereby moving the member 17 in an opposite direction to that in which the wheel is revolving and automatically taking up the slack of the strip of abrasive material. This movement of the member 17 partly rotates the ratchet gear 22, and the pawl 23 engaging with the ratchet gear holds the member 17 from a retrograde movement, as it continuously takes up the slack of the strip of abrasive material. The strip of abrasive material may also be tightened by hand when the wheel is at rest by pushing the member 17 of the take-up mechanism toward the stud 25, when it is held by the ratchet gear 22 and pawl 23.

Having thus described my invention, I claim as new and desire to secure by Letters Patent;—

1. In a grinding or polishing wheel, a strip of abrasive or polishing material on the peripheral face of the wheel, a take-up mechanism actuated by centrifugal force and operatively connected with the strip of abrasive or polishing material, and means in the

take-up mechanism for holding the same from a retrograde movement.

2. In a grinding or polishing wheel, a strip of abrasive or polishing material on the peripheral face of the wheel and fixed at one end to the wheel, an automatic take-up mechanism actuated by centrifugal force and operatively connected to the opposite end of the strip of abrasive or polishing material, and automatic means in the take-up mechanism for automatically holding the same from a retrograde movement.

3. In a grinding or polishing wheel, a strip of abrasive or polishing material on the peripheral face of the wheel and detachably secured at one end to the wheel, an automatic take-up mechanism actuated by centrifugal force and a coiled spring, means for detachably securing the opposite end of the strip of abrasive or polishing material to the automatic take-up mechanism, and means in the take-up mechanism for automatically holding the same from a retrograde movement.

4. In a grinding or polishing wheel, the combination of the following instrumentalities: a wheel *b* having a hub 6, an annular rim 7 in the face of which is a transverse slot 8, a thickened portion 9 at one edge of the slot 8 and having a hole 10 and a slit 11 extending from the hole 10 out through the inner face of the portion 9, a central web 12 having a counterbalanced portion 13, an opening 14, and an off-center bearing 15, an automatic take-up mechanism *c* consisting of a shaft 16, a U-shaped member 17 having the arms 18 18 and the cross bar 19 in which is a hole 20 and a slit 21 extending from the hole out, a ratchet gear 22 secured to the shaft 16, a pawl 23 pivotally secured to the web 12 in a position to engage with the ratchet gear 22, a coiled spring 24 connected with the pawl 23 and with a stud 25 on the web 12, a coiled spring 26 connected with the member 17 and with the stud 25, and a strip of abrasive or polishing material *d* having the beaded ends 27 and 28, as described.

5. In a grinding or polishing wheel, the combination of the following instrumentalities, a shaft *a*, a wheel *b* having a hub 6, an annular rim 7 in the face of which is a transverse slot 8, a thickened portion 9 at one edge of the slot and having a hole 10 and a slit 11 extending from the hole 10 out through the inner face of the portion 9, a central web 12 having a counterbalanced portion 13, an opening 14 and an off-center bearing 15, an automatic take-up mechanism *c* consisting of a shaft 16, in the bearing 15, a U-shaped member 17 having the arms 18 18 secured to the shaft 16 and the cross bar 19 in which is a hole 20 and a slit 21 extending from the hole out, a ratchet gear 22 secured to the shaft 16, a pawl 23 pivotally secured to the web 12 in a position to engage with

the ratchet gear 22, a coiled spring 24 connected with the pawl 23 and with a stud 25 on the web 12, a coiled spring 26 connected with the member 17 and with the stud 25, a weighted arm 29 on the member 17 and a strip of abrasive or polishing material *d* having the beaded ends 27 and 28, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CYRA B. WATTLES.

Witnesses:

ADA E. HAGERTY,
J. A. MILLER.